

Amdt. dated December 8, 2005  
Reply to Office action of 09/08/2005

Serial No. 10/020,692  
Docket No. SJO920010194US1  
Firm No. 0037.0020

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently amended) A method for implementing a remote method call, comprising:  
generating remote objects;  
generating a client communication object; and  
generating a server communication object, wherein the client and server communication  
objects enable communication between the client and the server communication objects;  
generating at least one proxy object, where each proxy object corresponds to one remote  
object;  
including data from the remote object into the proxy object; and  
processing a call to a method on one proxy object by:
  - (i) determining whether the method is implemented locally;
  - (ii) executing a local method including code to perform method operations on the  
proxy object without going to the remote object, in response to determining that the  
method is implemented locally; and
  - (iii) executing a remote method including code to perform method operations on  
the remote object, in response to determining that the method is not implemented locally,  
by:
    - (a) passing the remote method to the client communication object;
    - (b) transmitting to the server communication object, with the client  
communication object, an invocation method specifying the remote method on  
one specified remote object to the server communication object, wherein the  
server communication object is a first server communication object;
    - (c) determining, with the first server communication object, whether the remote  
object specified in the received invocation method is accessible through a second  
server communication object; and

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(d) transmitting, with the first server communication object, the received invocation method to the second server communication object to execute against the specified remote object.

(e) executing, with the second server communication object, the remote method specified in the invocation method on the specified remote object; and

(f) returning, with the second server communication object, data generated in response to execution of the remote method on the specified remote object to the client communication object.

2. (Previously presented) The method of claim 1, wherein executing one local method comprises processing data in the proxy object from the remote object, wherein remote object data is returned to a caller from the proxy object, wherein the remote object data is the data from the remote object included into the proxy object.

3. (Original) The method of claim 1, wherein generating the at least one proxy object further comprises:

transmitting a request to instantiate a proxy object for one specified remote object and a specified proxy class;

generating the proxy object in response to the request;

calling an initialization method from the specified proxy class to add data from the specified remote object to the generated proxy object; and

returning the generated proxy object for use in accessing the remote object.

4. (Original) The method of claim 3, wherein the proxy object class is a subclass of a remote object class, wherein the remote objects are instantiated from at least one remote object class, and wherein each remote object class is a subclass of a communication protocol class providing methods and attributes.

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5. (Canceled)

6. (Currently amended) The method of claim 5 1, wherein one client communication object is generated for each server communication object to which the client communication object will communicate.

7. (Currently amended) The method of claim 5 1, wherein each client communication object is instantiated from a client communication class and wherein each server communication object is instantiated from a server communication class, wherein the client and server communication classes implement methods from a communication protocol class.

8. (Previously presented) The method of claim 7, wherein the communication protocol class comprises a Java Remote Method Invocation (RMI) classes.

9. (Original) The method of claim 7, wherein the client communication object manages communication with the server communication object for a plurality of proxy objects on which remote methods are invoked to execute on corresponding remote objects.

10. (Original) The method of claim 7, wherein the client communication class includes code to handle error exceptions generated from the communication protocol class in response to executing remote methods on the plurality of proxy objects.

11 - 12. (Canceled)

13. (Currently amended) The method of claim 5 1, wherein the client communication class includes code to handle exceptions related to communication between the client communication object and the server communication object.

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14. (Original) The method of claim 1, wherein the remote object and proxy object are implemented in a same computer device, and wherein the local and remote method perform their operations on the same computer device.

15. (Original) The method of claim 1, wherein the remote objects are generated on a server system, wherein the call to the method on one proxy object occurs on a client system, wherein the server and client systems communicate over a network, wherein the local method includes code to perform the method operation on the proxy object on the client without going to the server and the remote method includes code to execute remotely on the server to perform method operations on the remote object on the server.

16. (Original) The method of claim 15, wherein the server comprises a first server and wherein the called method comprises a remote method, further comprising:

transmitting, with the client, information indicating the called remote method and remote object corresponding to the proxy object subject on which the remote method is called;

receiving, with the first server, the information indicating the remote method and remote object to execute;

determining, at the first server, whether the indicated remote object is on a second server; and

transmitting information on the indicated remote method and remote object to a second server for execution thereon if the indicated remote object for execution on the second server.

17. (Original) The method of claim 16, further comprising:

launching, with the client, an applet downloaded from the first server, wherein the applet calls the remote method on the proxy object corresponding to the remote object on the second server, and wherein the applet communicates the information indicating the remote method and remote object to the first server.

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18. (Original) The method of claim 14, wherein the server comprises a first server and wherein generating the at least one proxy object further comprises:

- receiving, with the first server, a method to instantiate a proxy object for a specified remote object;
- determining, at the first server, whether the specified remote object is on a second server;
- transmitting, with the first server, the method to instantiate the proxy object to the second server for execution thereon if the remote object is located on the second server.

19. (Original) The method of claim 18, further comprising:

- returning, with the second server, the instantiated proxy object to the first server to return to the client.

20. (Currently amended) A system for implementing a remote method call, comprising:

- means for generating remote objects;
- means for generating a client communication object; and
- means for generating a server communication object, wherein the client and server communication objects enable communication between the client and the server communication objects;

- means for generating at least one proxy object, where each proxy object corresponds to one remote object;
- means for including data from the remote object into the proxy object; and
- means for processing a call to a method on one proxy object by:
  - (i) determining whether the method is implemented locally;
  - (ii) executing a local method including code to perform method operations on the proxy object without going to the remote object, in response to determining that the method is implemented locally; and

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(iii) executing a remote method including code to perform method operations on the remote object, in response to determining that the method is not implemented locally, by:

- (a) passing the remote method to the client communication object;
- (b) transmitting to the server communication object, with the client communication object, an invocation method specifying the remote method on one specified remote object to the server communication object, wherein the server communication object is a first server communication object;
- (c) determining, with the first server communication object, whether the remote object specified in the received invocation method is accessible through a second server communication object; and
- (d) transmitting, with the first server communication object, the received invocation method to the second server communication object to execute against the specified remote object.
- (e) executing, with the second server communication object, the remote method specified in the invocation method on the specified remote object; and
- (f) returning, with the second server communication object, data generated in response to execution of the remote method on the specified remote object to the client communication object.

21. (Previously presented) The system of claim 20, wherein the means for executing one local method comprises processing data in the proxy object from the remote object, wherein remote object data is returned to a caller from the proxy object, wherein the remote object data is the data from the remote object included into the proxy object.

22. (Original) The system of claim 20, wherein the means for generating the at least one proxy object further performs:

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transmitting a request to instantiate a proxy object for one specified remote object and a specified proxy class;

generating the proxy object in response to the request;

calling an initialization method from the specified proxy class to add data from the specified remote object to the generated proxy object; and

returning the generated proxy object for use in accessing the remote object.

23. (Original) The system of claim 22, wherein the proxy object class is a subclass of the a remote object class, wherein the remote objects are instantiated from at least one remote object class, and wherein each remote object class is a subclass of a communication protocol class providing methods and attributes.

24. (Canceled)

25. (Currently amended) The system of claim ~~24~~ 20 wherein one client communication object is generated for each server communication object to which the client communication object will communicate.

26. (Currently amended) The system of claim ~~24~~ 20 , wherein each client communication object is instantiated from a client communication class and wherein each server communication object is instantiated from a server communication class, wherein the client and server communication classes implement methods from a communication protocol class.

27. (Previously presented) The system of claim 26, wherein the communication protocol class comprises a Java Remote Method Invocation (RMI) classes.

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28. (Original) The system of claim 26, wherein the client communication object manages communication with the server communication object for a plurality of proxy objects on which remote methods are invoked to execute on corresponding remote objects.

29. (Original) The system of claim 26, wherein the client communication class includes code to handle error exceptions generated from the communication protocol class in response to executing remote methods on the plurality of proxy objects.

30-31. (Canceled)

32. (Currently amended) The system of claim ~~24~~ 20, wherein the client communication class includes code to handle exceptions related to communication between the client communication object and the server communication object.

33. (Original) The system of claim 20, further comprising:  
a computer device, wherein the remote object and proxy object are implemented on the computer device.

34. (Original) The system of claim 20, further comprising:  
a client system;  
a server system;  
a network for enabling communication between the client and server system,  
wherein the remote objects are generated on the server system, wherein the call to the method on one proxy object occurs on a client system, wherein the local methods include code to perform the method operation on the proxy object on the client system without going to the server system and the remote methods include code to execute remotely on the server to perform method operations on the remote object on the server.



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35. (Currently amended) An article of manufacture including code for implementing a remote method call, wherein the code causes operations to be performed comprising:

generating remote objects;

generating a client communication object; and

generating a server communication object, wherein the client and server communication objects enable communication between the client and the server communication objects;

generating at least one proxy object, where each proxy object corresponds to one remote object;

including data from the remote object into the proxy object; and

processing a call to a method on one proxy object by:

(i) determining whether the method is implemented locally;

(ii) executing a local method including code to perform method operations on the proxy object without going to the remote object, in response to determining that the method is implemented locally; and

(iii) executing a remote method including code to perform method operations on the remote object, in response to determining that the method is not implemented locally,

by:

(a) passing the remote method to the client communication object;

(b) transmitting to the server communication object, with the client communication object, an invocation method specifying the remote method on one specified remote object to the server communication object, wherein the server communication object is a first server communication object;

(c) determining, with the first server communication object, whether the remote object specified in the received invocation method is accessible through a second server communication object; and

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(d) transmitting, with the first server communication object, the received invocation method to the second server communication object to execute against the specified remote object.  
(e) executing, with the second server communication object, the remote method specified in the invocation method on the specified remote object; and  
(f) returning, with the second server communication object, data generated in response to execution of the remote method on the specified remote object to the client communication object.

36. (Previously presented) The article of manufacture of claim 35, wherein executing one local method comprises processing data in the proxy object from the remote object, wherein remote object data is returned to a caller from the proxy object, wherein the remote object data is the data from the remote object included into the proxy object.

37. (Original) The article of manufacture of claim 35, wherein generating the at least one proxy object further comprises:

transmitting a request to instantiate a proxy object for one specified remote object and a specified proxy class;  
generating the proxy object in response to the request;  
calling an initialization method from the specified proxy class to add data from the specified remote object to the generated proxy object; and  
returning the generated proxy object for use in accessing the remote object.

38. (Original) The article of manufacture of claim 37, wherein the proxy object class is a subclass of a remote object class, wherein the remote objects are instantiated from at least one remote object class, and wherein each remote object class is a subclass of a communication protocol class providing methods and attributes.

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39. (Canceled)

40. (Currently amended) The article of manufacture of claim ~~39~~ 35, wherein one client communication object is generated for each server communication object to which the client communication object will communicate.

41. (Currently amended) The article of manufacture of claim ~~39~~ 35, wherein each client communication object is instantiated from a client communication class and wherein each server communication object is instantiated from a server communication class, wherein the client and server communication classes implement methods from a communication protocol class.

42. (Previously presented) The article of manufacture of claim 41, wherein the communication protocol class comprises a Java Remote Method Invocation (RMI) classes.

43. (Original) The article of manufacture of claim 41, wherein the client communication object manages communication with the server communication object for a plurality of proxy objects on which remote methods are invoked to execute on corresponding remote objects.

44. (Original) The article of manufacture of claim 41, wherein the client communication class includes code to handle error exceptions generated from the communication protocol class in response to executing remote methods on the plurality of proxy objects.

45 - 46. (Canceled)

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47. (Currently amended) The article of manufacture of claim ~~39~~ 35, wherein the client communication class includes code to handle exceptions related to communication between the client communication object and the server communication object.

48 - 65. (Canceled)